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10/655,809	09/05/2003	Todd M. Stanchfield	88507.0001	7110

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EXAMINER	
LIU, LI	
ART UNIT	**PAPER NUMBER**
2613	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/01/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/655,809	STANCHFIELD ET AL.	
	Examiner	Art Unit	
	Li Liu	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11/21/2006, Amendment*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *10-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *20* is/are allowed.

6)☒ Claim(s) *10-19, 26 and 27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed on November 11, 2006 with respect to claims 10-19, 26 and 27 have been fully considered but they are not persuasive. The examiner has thoroughly reviewed Applicant's amendment and arguments but firmly believes that the cited reference reasonably and properly meet the claimed limitation as rejected.

1). Applicant's argument – "Doyle is almost exclusively focused on an IR repeater having a single IR detector as illustrated, for example, in Fig. 1. Only at the very end of Doyle is reference made to Fig. 4 which shows an IR repeater having a first IR detector 204 and a second IR detector 206. The detectors 204 and 206 are said to be tuned to different modulating center frequencies. Beyond that, there is no discussion of Fig. 4. Consequently, there is no basis for applying the altered carrier frequency in Koinuma to Doyle"

Examiner's response – In the Description of the Drawing, Doyle clearly states that the FIG. 4 is an alternative embodiment for an IR detector illustrated in FIG. 3. Excepting the description for Figure 4 in column 2 line 34-47, Doyle also describes the function of the second receiver in claim 5-8, 18 and 19. Since the claims are part of the disclosure, Doyle gives the enough discussion of the two detectors.

2). Applicant's argument – "the modulated output signal of Koinuma which is related to the frequency of the carrier of the modulated input signal would not be enough to teach or suggest to one skilled in the art that the output signal be based on the first and second carrier frequencies as defined in claim 11".

Examiner's response – Applicant's claim 11 recites "the output signal is based on the remote control signal"; and the claim 10 and 11 do not define that the output signal has a frequency same as either the first remote control signal or the second control signal. Doyle teaches that each of the two detectors detects the IR light signal and generates a signal representing coded signal (claims 5 and 18 of Doyle). And Koinuma teaches that the output signal has a carrier frequency corresponding to the control signal (column 1 line 58-65). Both the invention as a whole and Doyle in view of Koinuma are directed to output two different signals for two different inputs. So, the combination of Doyle and Koinuma clearly suggests that the output signal be based on the first and second control signals.

3). Applicant's argument – "The gate 30 in Fig. 1 of Doyle is not disclosed in connection with the two IR detector embodiment of Fig. 4 and therefore cannot comprise a 'logical OR'".

Examiner's response – Doyle expressly states that the FIG. 4 is a schematic diagram illustrating an alternative embodiment for an IR detector 202 illustrated in FIG. 3. And the emitter electrode of the transistor Q1 is coupled to a ground through the **parallel connection** of the first IR detector 204 and the second IR detector 206. That is when two detectors are used, the gate is connected with the two detectors.

4). Applicant's argument – "The disclosure in Doyle that the receiver section is tuned to respond to a modulating signal center frequency in the middle of a range of frequencies used by respective manufacturers does not mean that the receiver module comprises a wideband receiver module. This simply means that the receiver section is chosen to have a band which encompasses the most common frequencies used by a group of manufacturers" and "Doyle does not disclose or suggest a single wideband receiver module, let alone two wideband receiver modules".

Examiner's response – Doyle clear states that the modulating frequency used by the manufacturer of the remote control unit is running from 32 kHz to 56 kHz, and the IR receiver can response to this range of frequencies (column 5, line 7-10, column 6 line 45-48); the receiver section is tuned to respond to a modulating signal center frequency about in the middle of the range of frequencies used by the respective manufacturers (column 2 line 66 to column 3 line 4); that is, the receiver section has a relatively wideband frequency response characteristic.

5). Applicant's argument – "The attempted combination of Koinuma with Doyle does not result in either a narrowband signal receiver or a wideband signal receiver."

Examiner's response – Doyle teaches that the first IR detector is tuned to a center frequency substantially near the lower end frequency ~38 kHz, and the second IR detector is tuned to a center frequency substantially near the upper end frequency ~56 kHz. The receiver tuned to 38 kHz or 56 kHz performs the same function as a narrowband receiver module since both are configured to generate a signal that corresponds to a portion of the infrared signal; that is, the teaching of the reference is

functionally equivalent to the claimed limitation. Also, Koinuma et al discloses an IR repeater with a narrowband signal receiver for noise suppression (Figure 1 and 2, column 2 line 66 to column 3 line 4).

6). Applicant's argument – "Claim 17 ..., adding either a fixed carrier frequency or a multifrequency signal to either the first signal or the second signal. In Doyle, a fixed carrier frequency can be added to one signal but not first and second signals as called for in the claim".

Examiner's response – the applicant's claim 17 recites "generates a signal that corresponds to one of the remote control signals, ..., by adding a fixed carrier frequency, **or** a multifrequency signal to either the first signal **or** the second signal" (note: the "OR" is used in the claim). Doyle teaches that a fixed carrier frequency is added to the received signal independent of the frequency of the received modulating signal (either the first or the second signals, claims 1 and 18 of Doyle).

7). Applicant's argument – "Doyle does not disclose or suggest measurement of pulse width duration in connection with the one embodiment thereof shown in Fig. 4 in which there are two receiver modules".

Examiner's response – Doyle expressly states that the FIG. 4 is a schematic diagram illustrating an alternative embodiment for an IR detector 202 illustrated in FIG. 3. Each one of two detectors is resistant to interference generated by CFLs (claim 8 of Doyle). And Doyle teaches that the duty cycle which determines the pulse width is used to distinguish the remote control signal and CFLs noise (column 5 line 14-31).

8). Applicant's argument – "Doyle merely discloses a second receiver module in Fig. 4 thereof without much discussion, and there is insufficient information contained therein so that one skilled in the art could arrive at a third receiver module within a repeater unit".

Examiner's response –Doyle teaches that the repeater may use one receiver for 38 KHz and then another for 58 KHz. Adding one more receiver as a whole presents no new or unexpected results, and do not define a patentably distinct invention over that in Doyle's system since both the invention as a whole and Doyle's system are directed to a multi-receiver system and it is "to duplicate a part for a multiple effect" (see St. Regis Paper Company v. Bemis Company, Inc., 193 USPQ 8 (CA 7 1977)).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 13, 15, 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Doyle (US 5,602,664).

1). With regard to claim 13, Doyle discloses a repeater unit (Figures 1, 3 and 4), comprising:

at least one receiver module (25 in Figure 1, column 3 line 34-36; or 204 in Figure 4, column 7 line 39-47) responsive to an infrared signal;

a controller unit (the combination of IR Receiver Section 20 and signal gate 30 and frequency oscillator 40 in Figure 1, or the combination of 202, 30 and 40 in Figure 3; based on the duty cycle or pulse width, the IR Receiver Section 20 is able to distinguish the remote control signal and CFLs noise, column 5 line 14-31) adapted to determine whether a signal based on the infrared signal corresponds to a remote control signal;

wherein the at least one receiver module comprises a wideband receiver module adapted to generate the signal based on the infrared signal (the receiver can response to a range of frequencies from 32 kHz to 56 kHz, column 5, line 7-10; the receiver section is tuned to respond to a modulating signal center frequency about in the middle of the range of frequencies used by the respective manufacturers, column 2 line 66 to column 3 line 4; that is, the receiver section has a relatively wideband frequency response characteristic).

2). With regard to claim 15, Doyle discloses a repeater unit (Figures 1, 3 and 4), comprising:

at least one receiver module (25 in Figure 1, column 3 line 34-36; or 204 in Figure 4, column 7 line 39-47) responsive to an infrared signal;

a controller unit (the combination of IR Receiver Section 20 and signal gate 30 and frequency oscillator 40 in Figure 1, or the combination of 202, 30 and 40 in Figure 3; based on the duty cycle or pulse width, the IR Receiver Section 20 is able to distinguish the remote control signal and CFLs noise, column 5 line 14-31) adapted to

determine whether a signal based on the infrared signal corresponds to a remote control signal;

wherein the at least one receiver module comprises a first receiver module (204 in Figure 4), tuned to a first carrier frequency (center frequency of 38 kHz, column 7 line 41-43), that receives the infrared signal and is configured to generate a first signal based on the infrared signal (claim 18, column 9 line 10-12), and a second receiver module (206 in Figure 4), tuned to a second carrier frequency (center frequency of 56 kHz, column 7 line 45-46), that receives the infrared signal and is configured to generate a second signal based on the infrared input signal (claim 18, column 9 line 18-20).

Doyle discloses wherein the first and second receiver modules comprise wideband receiver modules (the receiver can response to a range of frequencies from 32 kHz to 56 kHz, column 5, line 7-10; the receiver section is tuned to respond to a modulating signal center frequency about in the middle of the range of frequencies used by the respective manufacturers, column 2 line 66 to column 3 line 4) configured to generate signals based on the infrared signal (claim 5 and claim 18, column 9 line 10-12 and line 16-18).

3). With regard to claim 17, Doyle discloses a repeater unit (Figures 1, 3 and 4), comprising:

at least one receiver module (25 in Figure 1, column 3 line 34-36; or 204 in Figure 4, column 7 line 39-47) responsive to an infrared signal;

a controller unit (the combination of IR Receiver Section 20 and signal gate 30 and frequency oscillator 40 in Figure 1, or the combination of 202, 30 and 40 in Figure 3; based on the duty cycle or pulse width, the IR Receiver Section 20 is able to distinguish the remote control signal and CFLs noise, column 5 line 14-31) adapted to determine whether a signal based on the infrared signal corresponds to a remote control signal;

wherein the at least one receiver module comprises a first receiver module (204 in Figure 4), tuned to a first carrier frequency (center frequency of 38 kHz, column 7 line 41-43), that receives the infrared signal and is configured to generate a first signal based on the infrared signal (claim 18, column 9 line 10-12), and a second receiver module (206 in Figure 4), tuned to a second carrier frequency (center frequency of 56 kHz, column 7 line 45-46), that receives the infrared signal and is configured to generate a second signal based on the infrared input signal (claim 18, column 9 line 18-20).

wherein the controller unit (the combination of IR Receiver Section 20 and signal gate 30 and frequency oscillator 40 in Figure 1, or the combination of 202, 30 and 40 in Figure 3):

determines if the first signal based on the infrared signal is a valid remote control signal by determining if the first signal corresponds to one of the remote control signals (claim 8, and column 5 line 14-31), or

determines if the second signal based on the infrared signal is a valid remote control signal by determining if the second signal corresponds to one of the remote control signals (claim 8, and column 5 line 14-31); and

generates a signal that corresponds to one of the remote control signals (claim 18, and column 3 line 65 to column 4 line 6, and column 5 line 27-31, and column 5 line 56 to column 6 line 32), if the controller unit determines that either the first signal or the second signal is a valid remote control signal, by adding a fixed carrier frequency (e.g. 47 KHz column 7 line 19-30, and claim 18), to either the first signal or the second signal (column 7 line 11-30).

4). With regard to claim 18, Doyle discloses wherein the controller unit determines if the first signal corresponds to one of the remote control signals by measuring a pulse width of the first signal (the duty cycle of pulses is used to distinguish the CFLs and remote IR signals, column 5 line 14-31; claim 8, the two IR detectors are resistant to interference generated by CFLs), and determining if the pulse width of the first signal is greater or less than a predetermined duration that corresponds to a duration of a carrier of one of the remote control signals (Figure 2b, column 5, line 14-31).

5). With regard to claim 19, Doyle discloses wherein the controller determines that the second signal corresponds to one of the remote control signals by measuring a pulse width of the second signal (the duty cycle of pulses is used to distinguish the CFLs and remote IR signals, column 5 line 14-31; claim 8, the two IR detectors are resistant to interference generated by CFLs), and determining if the pulse width of the

second signal is greater or less than a predetermined duration that corresponds to a duration of a carrier of one of the remote control signals (Figure 2b column 5, line 14-31).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 10-12, 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doyle (US 5,602,664) in view of Koinuma et al (US 5,301,355).

1). With regard to claims 10 and 11, Doyle discloses a repeater unit comprising:

at least one receiver module (25 in Figure 1, column 3 line 34-36; or 204 in Figure 4, column 7 line 39-47) responsive to an infrared signal;

a controller unit (the combination of IR Receiver Section 20 and signal gate 30 and frequency oscillator 40 in Figure 1, or the combination of 202, 30 and 40 in Figure 3; based on the duty cycle or pulse width, the IR Receiver Section 20 is able to distinguish the remote control signal and CFLs noise, column 5 line 14-31) adapted to determine whether a signal based on the infrared signal corresponds to a remote control signal;

wherein the at least one receiver module comprises a first receiver module (204 in Figure 4), tuned to a first carrier frequency (center frequency of 38 kHz, column 7 line

41-43), that receives the infrared signal and is configured to generate a first signal based on the infrared signal (claim 18, column 9 line 10-12), and

a second receiver module (206 in Figure 4), tuned to a second carrier frequency (center frequency of 56 kHz, column 7 line 45-46), that receives the infrared signal and is configured to generate a second signal based on the infrared input signal (claim 18, column 9 line 18-20),

wherein the infrared signal comprises at least one of a noise input (CFLs noise, column 5, line 14-31) and the remote control signal (the input from remote control unit, Figure 4, and claim 8, column 8 line 32-34),

wherein the controller unit is adapted to distinguish between the noise input and the remote control signal (based on the duty cycle or pulse width, the IR Receiver Section 20 is able to distinguish the remote control signal and CFLs noise, column 5 line 14-31; claim 8, column 8 line 32-34, the repeater is resistant to interference generated by CFLs),

wherein the controller unit generates an output signal that corresponds to the remote control signal (column 3 line 38-46, and claim 18, column 9 line 10-12 and line 18-20) if the controller unit determines that at least a portion of the first signal or the second signal corresponds to the remote control signal (column 5 line 14-31),

Doyle teaches that each of the two detectors detects the IR light signal and generates a signal representing coded signal (claims 5 and 18 of Doyle). But, Doyle does not expressly state that wherein the output signal generated by the controller unit comprises at least one of a remote control signal having the first carrier frequency and a remote control signal having the second carrier frequency.

However, Koinuma et al, in the same field of endeavor, discloses an IR repeater whose modulated output signal is related to the frequency of the carrier of the modulated input signal, and Koinuma teaches that the output signal has a carrier frequency corresponding to the control signal (column 1 line 55-68).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the system and method as taught by Koinuma et al to the system of Doyle so that the output signal comprises the remote control signal having the first or second carrier frequency, and then for better control other consumer electronic equipments.

2). With regard to claim 11, Doyle in view of Koinuma discloses all of the subject matter as applied in claim 10 above. And Doyle further discloses wherein the output signal is based on the remote control signal having the first carrier frequency and the remote control signal having the second carrier frequency (Figures 3 and 4, each of the two detectors detects the IR light signal and generates a signal representing coded signal, claims 5 and 18 of Doyle, the Gate 30 responds to both the first input 204 tuned to a center frequency of ~32 kHz and second input 206 tuned to a center frequency of ~56 kHz).

3). With regard to claim 12, Doyle discloses all of the subject matter as applied in claims 10 and 11 above. And Doyle further disclose wherein the output signal comprises the result of a logical OR operation performed on the remote control signal having the first carrier frequency and the remote control signal having the second carrier frequency (the applicant states that through "logical OR" operation, the controller unit 90 simultaneously generates an output signal that logically combines both carrier outputs so that the output signal can control different components controlled by both carrier frequencies [0065]; in Doyle's system, Figure 3 and 4, the Gate 30 responds to both the first input 204 and second input 206, so is the "logical OR", and the modulating signal produced by the oscillator is also about in the middle of a wideband frequencies that covering the first and second frequencies, column 3 line 2-9).

4). With regard to claim 14, Doyle discloses a repeater unit (Figure 1 and Figure 3), comprising:

at least one receiver module (25 in Figure 1, column 3 line 34-36; or 204 in Figure 4, column 7 line 39-47) responsive to an infrared signal;

a controller unit (the combination of IR Receiver Section 20 and signal gate 30 and frequency oscillator 40 in Figure 1, or the combination of 202, 30 and 40 in Figure 3; based on the duty cycle or pulse width, the IR Receiver Section 20 is able to distinguish the remote control signal and CFLs noise, column 5 line 14-31) adapted to determine whether a signal based on the infrared signal corresponds to a remote control signal.

But Doyle does not expressly disclose wherein the at least one receiver module comprises a narrowband receiver module configured to generate a signal that corresponds to a portion of the infrared signal. However, Doyle teaches that the first IR detector is tuned to a center frequency substantially near the lower end frequency ~38 kHz, and the second IR detector is tuned to a center frequency substantially near the upper end frequency ~56 kHz. The receiver tuned to 38 kHz or 56 kHz performs the same function as a narrowband receiver module since both are configured to generate a signal that corresponds to a portion of the infrared signal; that is, the teaching of the reference is functionally equivalent to the claimed limitation. Also, Koinuma et al, in the same field of endeavor, discloses IR repeater with a narrowband signal receiver for noise suppression (Figure 1 and 2, column 2 line 66 to column 3 line 4). Koinuma et al's system is noise resistant (column 3 line 65 to column 4 line 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply a narrowband receiver as taught by Koinuma et al to the system of Doyle so that the external noise from fluorescent lamps can be prevented, and the signal to noise ratio can be increased.

5). With regard to claim 16, Doyle discloses a repeater unit (Figures 1, 3 and 4), comprising:

at least one receiver module (25 in Figure 1, column 3 line 34-36; or 204 in Figure 4, column 7 line 39-47) responsive to an infrared signal;

a controller unit (the combination of IR Receiver Section 20 and signal gate 30 and frequency oscillator 40 in Figure 1, or the combination of 202, 30 and 40 in Figure

3; based on the duty cycle or pulse width, the IR Receiver Section 20 is able to distinguish the remote control signal and CFLs noise, column 5 line 14-31) adapted to determine whether a signal based on the infrared signal corresponds to a remote control signal;

wherein the at least one receiver module comprises a first receiver module (204 in Figure 4), tuned to a first carrier frequency (center frequency of 38 kHz, column 7 line 41-43), that receives the infrared signal and is configured to generate a first signal based on the infrared signal (claim 18, column 9 line 10-12), and a second receiver module (206 in Figure 4), tuned to a second carrier frequency (center frequency of 56 kHz, column 7 line 45-46), that receives the infrared signal and is configured to generate a second signal based on the infrared input signal (claim 18, column 9 line 18-20).

But Doyle does not expressly disclose wherein the first and second receiver modules comprise narrowband receiver modules that are configured to generate a first signal and a second signal that correspond to a portion of the infrared signal. However, Doyle teaches that the first IR detector is tuned to a center frequency substantially near the lower end frequency ~38 kHz, and the second IR detector is tuned to a center frequency substantially near the upper end frequency ~56 kHz. The receiver tuned to 38 kHz or 56 kHz performs the same function as a narrowband receiver module since both are configured to generate a signal that corresponds to a portion of the infrared signal; that is, the teaching of the reference is functionally equivalent to the claimed limitation. Also,

However, Koinuma et al, in the same field of endeavor, discloses IR repeater with a narrowband signal receiver for noise suppression (Figure 1 and 2, column 2 line 66 to column 3 line 4). Koinuma et al's system is noise resistant (column 3 line 65 to column 4 line 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply narrowband receiver taught by Koinuma et al to the system of Doyle so that the external noise from fluorescent lamps can be prevented, and the signal to noise ratio can be increased.

6. Claims 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doyle (US 5,602,664).

Doyle discloses a repeater unit (Figures 1, 3 and 4), comprising:

at least one receiver module (25 in Figure 1, column 3 line 34-36; or 204 in Figure 4, column 7 line 39-47) responsive to an infrared signal;

a controller unit (the combination of IR Receiver Section 20 and signal gate 30 and frequency oscillator 40 in Figure 1, or the combination of 202, 30 and 40 in Figure 3; based on the duty cycle or pulse width, the IR Receiver Section 20 is able to distinguish the remote control signal and CFLs noise, column 5 line 14-31) adapted to determine whether a signal based on the infrared signal corresponds to a remote control signal;

wherein the at least one receiver module comprises a first receiver module (204 in Figure 4), tuned to a first carrier frequency (center frequency of 38 kHz, column 7 line 41-43), that receives the infrared signal and is configured to generate a first signal

based on the infrared signal (claim 18, column 9 line 10-12), and a second receiver module (206 in Figure 4), tuned to a second carrier frequency (center frequency of 56 kHz, column 7 line 45-46), that receives the infrared signal and is configured to generate a second signal based on the infrared input signal (claim 18, column 9 line 18-20).

But Doyle does not disclose that the repeater comprises a third receiver module, tuned to a third carrier frequency, that receives the infrared signal and is configured to generate a third signal based on the infrared input signal (claim 26); wherein the third carrier frequency is centered about 455 kHz (claim 27).

Although Doyle doesn't specifically disclose the third receiver module tuned to a third carrier frequency 455 KHz, such limitation is merely a matter of design choice and would have been obvious in the system of Doyle. Doyle teaches that the repeater may use one receiver for 38 KHz and then another for 58 KHz. The limitations in claims 26 and 27 do not define a patentably distinct invention over that in Doyle's system since both the invention as a whole and Doyle's system are directed to a multi-receiver system. Adding one more receiver as a whole presents no new or unexpected results. And claims 26 and 27 are not patentable different from the repeater system in Doyle, because it is "to duplicate a part for a multiple effect" (see St. Regis Paper Company v. Bemis Company, Inc., 193 USPQ 8 (CA 7 1977)).

Allowable Subject Matter

7. Claim 20 is allowed.

8. The following is a statement of reasons for the indication of allowable subject matter: the present invention comprises multiple receiver modules, controller unit, amplifier and emitter. The closest prior art, Doyle (US 5,602,664), shows a similar system, and two receiver modules are used. However, the prior art fails to discloses that even though the pulse width of the first output signal or the second signal is less than the predetermined duration, the controller unit still can determine that either the first signal or the second signal corresponds to one of the remote control signals if the first signal and the second signal are simultaneously active.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Pugel (US 6,895,252) discloses an IR extension system.

Thomas (US 6,400,480) discloses a battery module transceiver for extending the range of infrared remote controller.

Dockery (US 4,809,359) discloses a system for extending the IR remote control.

Martnelli et al (US 5,982,519) discloses an infrared communications scheme.

Teich et al (US 4,850,040) discloses an IR remote control system.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Li Liu whose telephone number is (571)270-1084. The examiner can normally be reached on Mon-Fri, 8:00 am - 5:30 pm, alternating Fri off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on (571)272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Li Liu
January 22, 2007

KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER